

RC Pulse to PWM reference board

WARNINGS:

Be very careful about applying power to the motor control chip. Reversed power **WILL** destroy the TI754410 motor driver chip. The chip is soldered in place to take advantage of the ground plane heat sink and is difficult to replace.

This board contains static sensitive devices. Observe normal precautions.

This board has *no* polarity reversal protection, nor does it have any input protection for the microprocessor. Although the board has proved rugged in casual use, please exercise caution in connecting it with your R/C gear or microprocessor board.

There are holes on the board for a 78105 voltage regulator. This part is not supplied. Power can be taken from your R/C receiver via the input pins. If you are using a relatively low motor voltage, less than 10v, then it is reasonable to put in a voltage regulator and run your R/C radio from the controller board powered through the same cables on the input. This is not practical for higher motor supply voltages, as the regulator will overheat.

Specifications:

- Maximum current draw per channel: 1.1A (TI 754410 dual H-Bridge)
- Maximum supply voltage: 35v
- Switching frequency: 1.0-1.7 kHz (high vs. low range select)
- R/C Pulse width resolution: 4 uS (sampled at 250khz)
- Number of steps: 75 (low range) 125 (high range)

The jumpers:

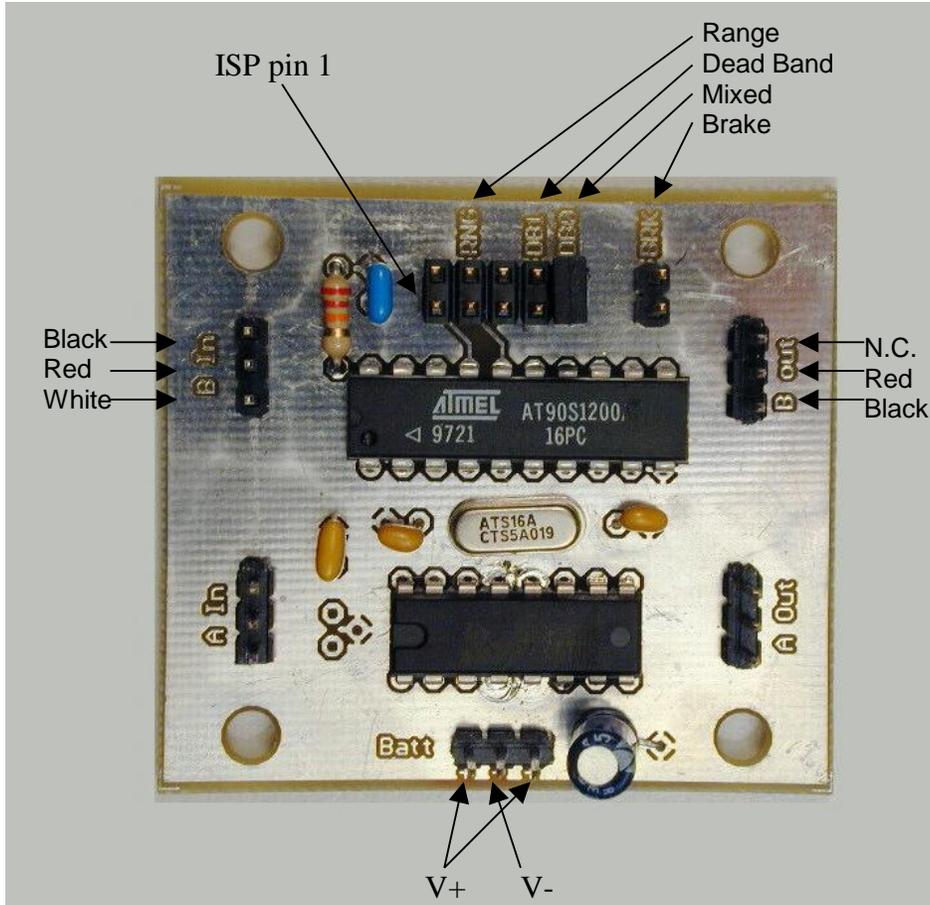
Brk: Opened = COAST, Connected = BRAKE when zero drive is detected (1.5ms pulse +/- dead band)

Rng: Opened = .8 ms, Connected = 1.0 ms range of input pulses for -100% to 100% power. The narrower range is more appropriate for off-the-shelf R/C gear where you don't have control over the pulse width range. The wider range is for computer control (e.g. basic stamp), which has arbitrary wide ranges.

DB1: Open = 12 uS, Connected = 2 uS Zero Drive Dead Band. This sets a small dead band around which the Zero position of the input pulse is compared. The default is appropriate for R/C gear that has mechanical slop and doesn't always put out a precise 1.5ms pulse when the control sticks are centered.

DB0: **(Note changed functionality)** Open = Normal, Connected = Mixed mode. Mixed mode is where the A channel determines the output level for both A and B, and the B channel differentially modifies the output. This is for single joystick motion control of a differentially driven base (e.g. Tank). Normal operation is two independent channels.

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RC/PWM Connectors and Jumpers

Input connectors:

Looking towards the input connectors, the wiring is from left to right: BLACK, RED, and WHITE. That is, the left most pin is GND. This is standard R/C servo connector orientation. However, the board has pins, not a socket, so standard R/C Servo extension cables will not work. You need cables that are female on both ends: one end plugs into your R/C receiver and the other end into the converter board

Output Connectors:

Looking towards the output connectors, the two active pins are on the LEFT. If connecting a hacked servo, the wires would be, from left to right: BLACK, RED, and WHITE.

Motor Battery Connector:

The motor voltage supply is a three-pin connector with the center pin being V-. It is not necessary to connect V+ to both outer pins.

In System Programming Connector (ISP)

A standard Atmel STK200 programming dongle can be connected to the ISP header (with jumpers removed, of course). The orientation is that the key points towards the center of the board. Pin 1 being the lower left pin in the picture, above.